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### Thinking through postoperative cognitive dysfunction

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## **Hovens et al.- Thinking through POCD- Appendix 2**

### **Appendix 3: Systematic review of the brain areas involved in POCD**

Neuroimaging has contributed greatly to the understanding of the brain areas involved in cognitive tasks. To determine which brain areas might be involved in POCD, another MEDLINE search was performed. The following keywords were used: (digit span OR visual verbal learning OR auditory verbal learning OR immediate recall OR delayed recall OR paragraph recall OR Randt memory OR ECO memory OR concept shifting OR Stroop OR Letter-digit substitution OR Trail making) AND (neuroimaging OR imaging OR MRI OR PET OR EEG). Full text publications were obtained of studies detailing the activation patterns in the brain of subjects performing aforementioned neuropsychological tests. Only studies that used appropriate control groups were used for further analysis. Some comments need to be made concerning the analysis of these neuroimaging studies. Firstly, although neuroimaging results of cognitive tests usually agree up to a certain level, the outcomes vary substantially when it comes to anatomic details. Therefore, only the brain regions on which several studies consented are mentioned. Furthermore, in most neuroimaging studies of cognitive tasks, the tasks that are used as a control also depend on cognitive processes. One could for example think of the reading aloud of colour names that are printed in the corresponding colour, which is used as a control in the Stroop task (Leung et al., 2000; Liotti et al., 2000). The brain areas involved in these control tasks are usually excluded from the analysis of cognitive functions necessary to perform a cognitive task.